

ANNEX C

SECTION 404(b)(1)
EVALUATION

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HERBERT HOOVER DIKE
MAJOR REHABILITATION EVALUATION REPORT

I. Project Description

a. Location. The proposed Herbert Hoover Dike (HHD) Major Rehabilitation Evaluation study is located at the HHD, which is an earthen levee surrounding Lake Okeechobee, in Glades, Hendry, Martin, Okeechobee, and Palm Beach Counties. Reach One is an approximate 22.4 mile long section of the HHD, extending from the St. Lucie Canal at Port Mayaca to the Hillsboro Canal at Belle Glade (see Figure 1 of the EIS).

b. General Description. The proposed project includes a hanging seepage cutoff wall on the landward side of the dike slope and a relief trench with an inverted filter and relief berm at the toe of the landward slope of the dike, stopping at the dike's toe ditch. The cut-off wall will be at the approximate 26' elevation on the HHD slope, excavation stopping prior to the impervious geologic layer. This will allow groundwater to flow beneath the HHD and underseepage to be collected by the relief trench. The relief trench and inverted filter will be constructed adjacent to the existing toe ditch and within the HHD footprint at the landward toe. An access road would be built on top of the relief trench. The plan is similar to the MRER solution Alternative No. 3, but would not contain a closed conduit as outlined in the MRER and utilizes the hanging cut-off wall to prevent piping. The closed conduit would be replaced with the existing open toe ditch for removal of seepage. Seepage water from the seepage toe berm and relief trench would flow freely into the existing toe ditch. The toe ditch geometry may have to be altered on the lakeward side of the ditch due to construction of the trench and drain system. The final design has to insure no negative impact of flood control. (Figure 5 of EIS).

c. Authority and Purpose. The Flood Control Act (Act), approved by Congress on 30 June 1948, authorized the first phase of a comprehensive plan to provide flood protection and other water control benefits in central and south Florida. The Act included measures for improving control of Lake Okeechobee by constructing or modifying the spillways and other structures, and enlarging the Lake Okeechobee levees to provide the intended flood protection, water storage and water supply. Levee seepage and stability have a direct effect on the capability of the levee to provide the authorized protection. The authorization for levee repairs and modifications of the Flood Control Act of 1948 justify the proposed renovation to Reach One of the HHD.

The general goal of the HHD MRER is to provide a reliable embankment system around Lake Okeechobee to contain the lake waters for flood protection, water supply, and navigation.

An unreliable embankment system, such as that which currently exists along Reach One of the HHD, could allow for a failure of the system to contain lake waters. Such a failure could result in loss of life, property, and habitat. A reasonable and effective rehabilitative effort is required to eliminate this possibility.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. Material from the levee will need to be excavated prior to installation of the cutoff wall, relief trench, inverted filter, and seepage berm. This material is composed primarily of fill material for the HHD from the excavation of lake rim canal and contains a mixture of sand, silts and clays with varying content of organic materials. The proposed seepage berm, relief trench, and inverted filter will be composed of select granular materials, primarily limestone or quartz, gravel and sand sized particles. The cutoff wall will be composed of cementitious slurry.

(2) Quantity of Material. Unknown. Specific information will be determined during detailed design.

(3) Source of Material. No definitive source of borrow material has been identified. A commercially licensed source of quarry material which produce ASPM standard gradations will be identified.

e. Description of the Proposed Discharge Site.

(1) Location. See Figure 1 of EIS.

(2) Size. Approximately 22 miles of landward HHD slope and HHD toe.

(3) Type of Site. The project site is an upland embankment composed primarily of fill material and vegetated by mixed grasses. The embankment toe is bordered by a toe ditch throughout most of Reach One. The toe ditch contains mostly invasive or exotic vegetation, but provides wetland habitat. Agricultural fields and residential development are adjacent to the HHD.

(4) Type of Habitat. The habitat consists of upland grasslands, invasive brush, inundated toe ditches, and residential back yard areas.

(5) Timing and Duration of Dredging.

f. Description of Disposal Method. As necessary for construction of each project element.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The cutoff wall will be excavated at 26 NGVD. The HHD landward toe ranges in elevation from 12 to 14 feet NGVD of 1929. The fill areas are at the base of the back toe of the landward side of the dike. Specific information regarding topography may be found in Section 3.03 of the FEIS.

(2) Type of Fill Material. The proposed fill for seepage berm and relief trench will be composed of select granular materials primarily limestone or quartz, gravel and sand sized particles. Cutoff wall will be composed of cementitious slurry.

(3) Dredge/Fill Material Movement. The fill material will be stabilized and should not be subject to erosion.

(4) Physical Effects on Benthos. Benthic organisms may be temporarily displaced during construction activities.

b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water Column Effects. Standing water and soils periodically inundated will be temporarily impacted during construction. Turbidity and erosion will be controlled during and post-construction.

Current Patterns and Circulation. Construction of the relief trench and berm at the toe ditches should have minimal effect on current hydrologic circulation patterns. Construction of the cutoff wall will have an impact to hydrological patterns within the HHD footprint. Seepage will flow between the bottom edge of the wall and the impervious layer. The underseepage will then be collected in existing toe ditch and constructed relief trench.

(3) Normal Water Level Fluctuations and Salinity Gradients. Surface and ground water levels will not be effected. Salinity levels should not be effected by the proposed project.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. There may be a temporary increase in turbidity levels in the project area during discharge. Turbidity will be

short-term and localized and no significant adverse impacts are expected. State standards for turbidity will not be exceeded.

(2) Effects on the Chemical and Physical Properties of the Water Column. There may be temporary impacts to the chemical and physical properties of nearby waters during construction activities. There are no acute or chronic chemical impacts anticipated as a result of construction. An environmental protection plan, prepared during detailed design, will address concerns regarding monitoring of equipment, maintenance and security of fuels, lubricants etc.

(a) Light Penetration. Some decrease in light penetration may occur in the immediate vicinity of the construction area. This effect will be temporary, limited to the immediate area of construction, and will have no adverse impact on the environment.

(b) Dissolved Oxygen. Dissolved oxygen levels will not be altered by this project.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens are expected to be released by the project.

(d) Aesthetics. The aesthetic quality of the water in the immediate area of the project may be temporarily effected by turbidity during construction. This will be a short-term and localized condition.

(3) Effects on Biota.

(a) Primary Productivity and Photosynthesis. Fill will replace approximately 22 miles of HHD toe vegetated by mixed upland grasses. An access road will be built on top of inverted filter and berm, eliminating their primary productivity. Primary production within the lake outflows should not be affected.

(b) Suspension/Filter Feeders. An increase in turbidity in the toe ditch could adversely impact burrowing invertebrate filter feeders within and adjacent to the immediate construction area. It is not expected that a short-term, temporary increase in turbidity will have any long-term negative impact on these highly fecund organisms.

(c) Sight Feeders. No significant impacts on these organisms are expected as the majority of sight feeders are highly motile and can move outside the project area.

d. Contaminant Determinations. Material which will be dredged from the proposed borrow site will not introduce, relocate, or increase contaminants at the fill area.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. No adverse impacts on autotrophic or heterotrophic organisms are anticipated.

(2) Effects on Benthos. No adverse impacts benthic organisms are anticipated.

(3) Effects on Nekton. Mostly small forage fish may be temporarily displaced by construction and turbid water. However, no long-term adverse impacts on nekton are anticipated.

(4) Effects on the Aquatic Food Web. No adverse impacts on aquatic organisms is anticipated. There is expected to be a relatively minor temporary effect on the aquatic food web due to construction activities. Wetlands at toe ditch and lake should maintain their functional value.

(5) Effects on Special Aquatic Sites.

(a) Hardground and Coral Reef Communities. There are no hardground or coral reef communities located within the proposed project site.

(6) Endangered and Threatened Species. There will be no significant adverse impacts on any threatened or endangered species or on critical habitat of any threatened or endangered species. Refer to Section 5.00 of the Draft EIS for measures that will be implemented to protect endangered and threatened species.

(7) Other Wildlife. No adverse impacts to small foraging mammals, reptiles, or wading birds, or wildlife in general are expected.

(8) Actions to Minimize Impacts. All practical safeguards will be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area. Specific precautions are discussed in the Draft EIS.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. The dredged material will not cause unacceptable changes in the mixing zone water quality requirements as specified by the State of Florida's Water Quality Certification permit procedures. No adverse impacts related to depth, current velocity, direction and variability, degree of turbulence, stratification, or ambient concentrations of constituents are expected from implementation of the project.

(2) Determination of Compliance with Applicable Water Quality Standards. Because of the inert nature of the material to be used as fill, Class III water quality standards will not be violated.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. No municipal or private water supplies will be impacted by the implementation of the project.

(b) Recreational and Commercial Fisheries. Recreational and commercial fisheries should not be impacted by the implementation of the project.

(c) Water Related Recreation. Water related recreation in the immediate vicinity of construction will likely be impacted during construction activities. This will be a short-term impact.

(d) Aesthetics. The existing environmental setting may be adversely impacted, particularly at parks and other natural settings. Construction activities will cause a temporary increase in noise and air pollution caused by equipment as well as some temporary increase in turbidity. Some vegetation buffering natural areas or parks may be unavoidably removed during construction. These impacts are not expected to adversely affect the aesthetic resources over the long term and once construction ends, conditions will return to pre-project levels. Trees removed would be replaced.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. State and local parks do exist within the proposed project area and would be temporarily impacted by construction activities as described in (d) above. In addition, certain stretches of the LOST may be damaged or removed by construction activities. These impacts would be minimized and avoided as practicable.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. There will be no cumulative impacts that result in a major impairment of water quality of the existing aquatic ecosystem as a result of the placement of fill at the project site.

h. Determination of Secondary Effects on the Aquatic Ecosystem. There will be no secondary impacts on the aquatic ecosystem as a result of the construction.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.

c. The discharge of fill materials will not cause or contribute to, violations of any applicable State water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

d. The placement of fill materials for implementation of the proposed project will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

e. The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

f. Appropriate steps have been taken to minimize the adverse environmental impact of the proposed action. Turbidity will be monitored so that if levels exceed State water quality standards, the contractor will be required to cease work until conditions return to normal.

g. On the basis of the guidelines, the proposed disposal of dredged material and fill of wetlands are specified as complying with the requirements of these guidelines.